UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,834	05/26/2005	Peter C. Harris	07039-386US1	6384

26191 7590 10/04/2007

FISH & RICHARDSON P.C.
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
BERTAGNA, ANGELA MARIE	
ART UNIT	**PAPER NUMBER**
1637	

MAIL DATE	DELIVERY MODE
10/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/501,834	HARRIS ET AL.	
	Examiner	Art Unit	
	Angela Bertagna	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *19 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,8-13,16-19,29-37,40,43-66,78,90 and 102-104* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/1/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 1,2,5,8-13,16-19,29-37,40,43-51,60-66,78,90 and 102-104.

DETAILED ACTION

Remarks

1. This application has been reassigned to Examiner Angela Bertagna in Art Unit 1637 whose correspondence information is provided in the conclusion of this Office Action.

Election/Restrictions

2. Applicant's election with traverse of Group II, claims 52-59 in the reply filed on July 19, 2007 is acknowledged. The traversal is on the ground(s) that claims 49-51 should be included in Group II since the nucleic acids recited in these claims are 10-1650 nucleotides in length, are at least 80% identical to SEQ ID NO: 1, include one or more variants of SEQ ID NO: 1, and do not encode a fibrocystin polypeptide. Applicant's arguments were fully considered but were not found persuasive, because the nucleic acids of claims 49-51 share more features in common with Group I than Group II. More specifically, unlike the nucleic acids of Group II, the nucleic acids of claims 49-51 are required to be at least 80% identical over 10-1650 nucleotides with SEQ ID NO: 1, which has been placed in Group I. Furthermore, the only relationship between the nucleic acids of Groups I and II is that the nucleic acids of Group II are required to contain a nucleotide sequence variant relative to SEQ ID NO: 1. Since any nucleic acid amplification product produced by any primer pair other than a primer pair designed to only amplify SEQ ID NO: 1 would generate such products this relationship does not suggest that the primers of Group II should be grouped with the nucleic acids of Group I. Rather, the nucleic acids of Groups I and II are distinct products subject to restriction. Finally, inclusion of claims 49-51 in the elected group would present a serious search and examination burden. Claims 49-51 require the isolated

nucleic acid to be at least 80% identical to SEQ ID NO: 1 and contain a specific variant nucleotide relative to SEQ ID NO: 1. Search and examination of these additional limitations would impose a serious burden.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1, 2, 5, 8-13, 16-19, 29-37, 40, 43-51, 60-66, 78, 90, and 102-104 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on July 19, 2007.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Priority

3. Applicant's priority claim to Provisional Application 60/351,110, filed January 23, 2002 is acknowledged.

Information Disclosure Statement

4. Applicant's submission of an Information Disclosure Statement on August 1, 2005 is acknowledged. A signed copy is enclosed.

Drawings

5. The drawings filed July 19, 2004 are acceptable.

Claim Objections

6. Claims 52-59 are objected to because of the following informalities: Independent claims 52 and 58 recite the acronym ARPKD. This acronym should be defined in the claims to avoid confusion as to its meaning. Appropriate correction is required.

Claim Rejections - 35 USC § 112 (Written Description)

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 52-59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 52-59 are drawn to compositions comprising primer pairs, wherein the primers are 10-50 nucleotides in length and produce an amplification product corresponding to a region of an autosomal recessive polycystic kidney disease (ARPKD) nucleic acid molecule that is 30-1650 nucleotides in length from mammalian genomic DNA. The specification defines "an ARPKD nucleic acid molecule" as a nucleic acid comprising a gene that leads to a phenotype of ARPKD when the gene is mutated in both alleles (see page 11, lines 12-29). The genus of

nucleic acids encompassed by this definition is very large and includes any nucleic acid from any organism (e.g. humans, monkeys, rats, mice, pigs, cats, dogs, etc) that when mutated in both alleles is associated with an ARPKD phenotype. For example, the specification teaches that the human PKHD1 gene and the rat and mouse Pkhd1 genes are ARPKD nucleic acids (page 11, lines 12-20). Therefore, an ARPKD nucleic acid includes any PKHD1 ortholog from monkeys, pigs, cows, horses, cats, dogs, etc. This genus of PKHD1 nucleic acids encompassed by the claims is very large and includes hundreds of thousands of members each of which inherently possesses different structural and functional properties.

In addition to the PKHD1 genes taught by the specification to be ARPKD nucleic acids, the prior art teaches other genes that are ARPKD nucleic acid molecules. For example, Iakoubova et al. (Genomics (1995) 26: 107-114) teaches that the juvenile cystic kidneys (jck) recessive mutation results in an ARPKD phenotype in mice (page 107, column 2). Liu et al. (Development (2002) 129: 5839-5846) determined that this mutation maps to the Nek8 gene (see summary on page 5839 and pages 5843-5845). Also, Onuchic teaches that the recessive TgN737Rpw mutation in the Tg737 gene results in an ARPKD phenotype in mice (pages 805 and 807). Since the ARPKD nucleic acids taught by Iakoubova and Onuchic are different from the PKHD1 gene disclosed in the specification, the claimed genus of ARPKD nucleic acid molecules encompasses not just human PKHD1 and its orthologs but also other unrelated genes, such as Nek8 and Tg737 and their orthologs. Thus, the claimed genus of ARPKD nucleic acid molecules is very large, including hundreds of thousands of molecules with very different structural and functional properties.

The MPEP at section 2163 states, "An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1996 (Fed. Cir. 1997)."

Regarding genus claims, section 2163 of the MPEP states, "For each claim drawn to a genus: The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between structure and function, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. See Eli Lilly, 119 F.3d at 1568, 43 USPQ2d at 1406.

"A "representative number of species" means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. The disclosure of only one species encompassed within a genus adequately describes a claim directed to that genus only if the disclosure "indicates that the patentee has invented species sufficient to constitute the gen[us]." See Enzo Biochem, 323 F.3d at 966, 63 USPQ2d at 1615; Noelle v. Lederman, 355 F.3d 1343, 1350, 69 USPQ2d 1508, 1514 (Fed. Cir. 2004) (Fed. Cir. 2004)("[A] patentee of a biotechnological invention cannot necessarily claim a genus after only describing a limited number of species, because there may be unpredictability in the results

obtained from species other than those specifically enumerated."). "A patentee will not be deemed to have invented species sufficient to constitute the genus by virtue of having disclosed a single species when ... the evidence indicates ordinary artisans could not predict the operability in the invention of any species other than the one disclosed." In re Curtis, 354 F3d 1347, 1358, 69 USPQ2d 1274, 1282 (Fed. Cir. 2004)".

Furthermore, MPEP 2163 states, "What constitutes a "representative number" is an inverse function of the skill and knowledge in the art. Satisfactory disclosure of a "representative number" depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed. For inventions in an unpredictable art, adequate written description of a genus which embraces widely variant species cannot be achieved by disclosing only one species within the genus. See, e.g., Eli Lilly. Description of a representative number of species does not require the description to be of such specificity that it would provide individual support for each species that the genus embraces. If a representative number of adequately described species are not disclosed for a genus, the claim to that genus must be rejected as lacking adequate written description under 35 U.S.C. 112, paragraph 1.

In the instant case, Applicant discloses the nucleic acid sequence of the human, rat, and mouse PKHD1 gene (see Figures 3, 6, and 7, respectively). Applicant also discloses several variants of these nucleic acid molecules (see pages 13-19 and Figures 11-12). However, Applicant does not disclose any other ARPKD nucleic acids within the large claimed genus. This disclosure of a small number of specific examples of only one type of ARPKD nucleic acid (human PKHD1 and several variants thereof, a rat ortholog, and a mouse ortholog) when the

genus comprises hundreds of thousands of members does not satisfy the requirement to disclose a representative number of species. Therefore, it must be concluded that at the time of filing, Applicant did not have possession of the claimed invention.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 52-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (Genomics (1999) 57: 249-255).

Regarding claims 52 and 58, Park teaches a composition comprising a plurality of primer pairs, wherein each primer is 10-50 nucleotides in length, and wherein each primer pair in the presence of mammalian genomic DNA and under polymerase chain reaction conditions, produces a nucleic acid product corresponding to a region of an ARPKD nucleic acid molecule that is 30-1650 nucleotides in length (see page 250 and Table 1 on page 252, where Park teaches primers that amplify 42 STS markers within the PKDH1 interval). As shown in Table 1 on page 252, the lengths of the primers taught by Park are within the claimed range of 10-50 nucleotides. PCR amplification of mammalian genomic DNA using the primer pairs taught in Table 1 of Park generates ARPKD nucleic acid molecules within the claimed range of 30-1650 nucleotides (see Table 1).

Regarding claims 53 and 59, the PKDH1 nucleic acids amplified by Park inherently comprise a variant relative to SEQ ID NO: 1. For example, the 169 base pair product resulting from amplification using the P56C12(T7) primer pair contains a deletion relative to the 12,225 nucleotide sequence shown in SEQ ID NO: 1.

Regarding claims 54-57, Park teaches 42 different primer pairs (see Table 1 on page 252), which is at least three primer pairs, at least 13 primer pairs, at least 16 primer pairs, and at least 23 primer pairs.

10. Claims 52-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Onuchic et al. (Mammalian Genome (1995) 6: 805-808).

Regarding claims 52 and 58, Onuchic teaches a composition comprising a plurality of primer pairs, wherein each primer is 10-50 nucleotides in length, and wherein each primer pair in the presence of mammalian genomic DNA and under polymerase chain reaction conditions, produces a nucleic acid product corresponding to a region of an ARPKD nucleic acid molecule that is 30-1650 nucleotides in length (see pages 805-806 and Table 1). As discussed in section 7 above, the hTg737 gene amplified by Onuchic is an ARPKD nucleic acid molecule since mutation in both alleles results in an ARPKD phenotype (see pages 805 and 807). Also, as shown in Table 1 on page 806, the lengths of the primers taught by Onuchic are within the claimed range of 10-50 nucleotides. Finally, PCR amplification of mammalian genomic DNA using the primer pairs taught in Table 1 of Onuchic generates ARPKD nucleic acid molecules within the claimed range of 30-1650 nucleotides (see Table 1).

Regarding claims 53 and 59, the hTg737 nucleic acids amplified by Onuchic inherently comprise a variant relative to SEQ ID NO: 1 since SEQ ID NO: 1 comprises the human PKHD1 gene.

Regarding claims 54-57, Onuchic teaches 24 different primer pairs (see Table 1 on page 806), which is at least three primer pairs, at least 13 primer pairs, at least 16 primer pairs, and at least 23 primer pairs.

Conclusion

11. No claims are currently allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela Bertagna whose telephone number is 571-272-8291. The examiner can normally be reached on M-F, 7:30 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Angela Bertagna
Art Unit 1637 AB
September 28, 2007

amb

GARY BENZION, PH.D
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600